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# A Geometric Comparison of Aerofoil Shape Parameterisation Methods

## Supplementary Figures

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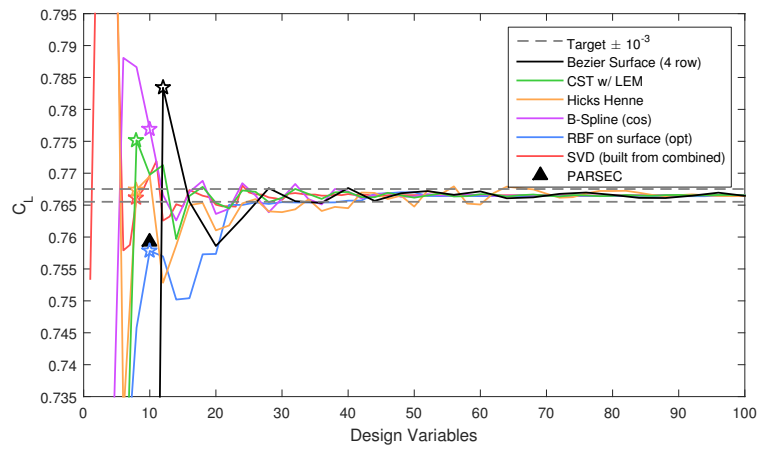
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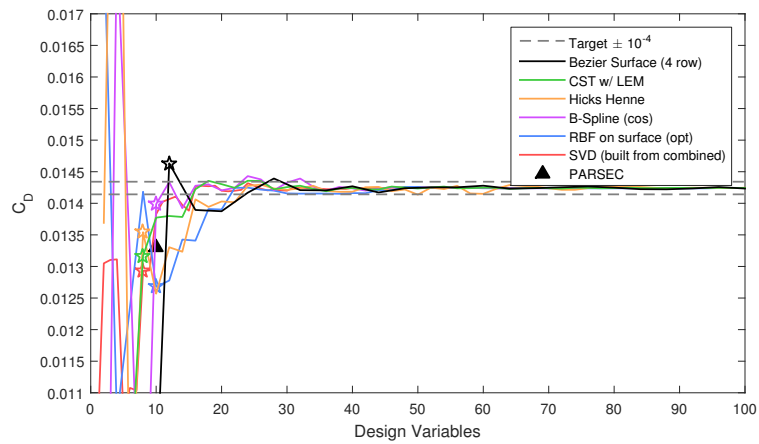
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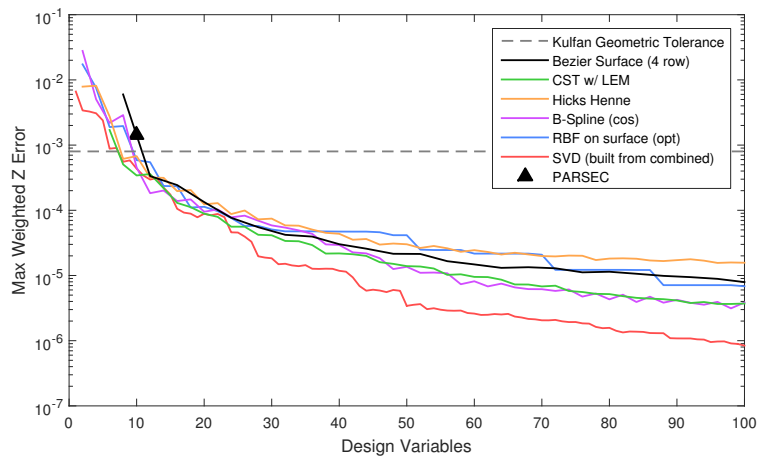
<sup>¶</sup>Graduate Student, AIAA Student Member, d.j.poole@bristol.ac.uk, Bristol, BS8 1TR, UK



a) Lift Coefficient

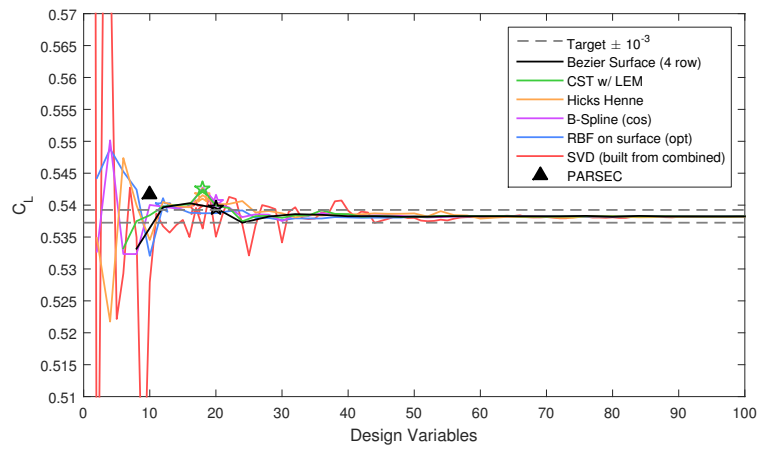


b) Drag Coefficient

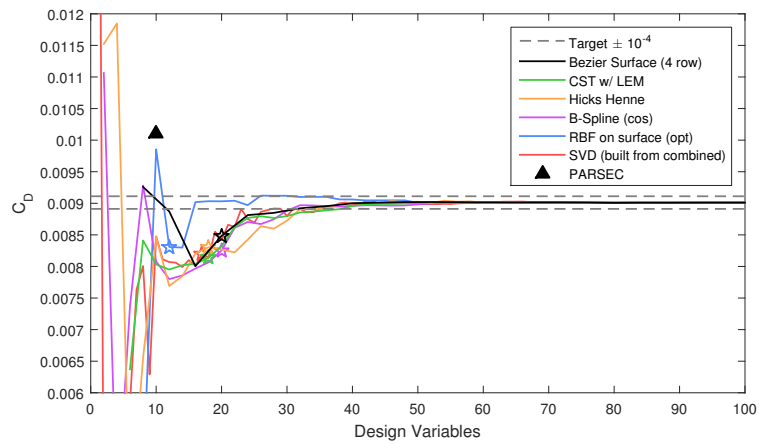


c) Max Weighted  $z$  Error

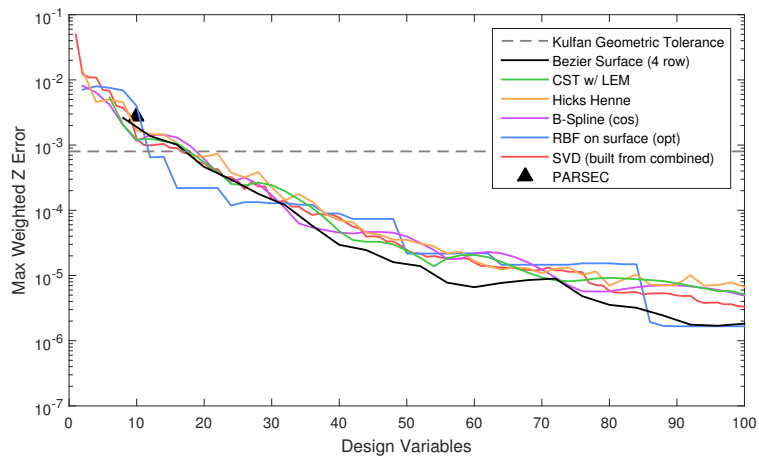
Figure 1. Convergence of aerodynamic and geometric properties for increasing design variables for each parameterisation method for the NACA4412 case study; ★ represents first point Kulfan's geometry tolerance is satisfied.



a) Lift Coefficient

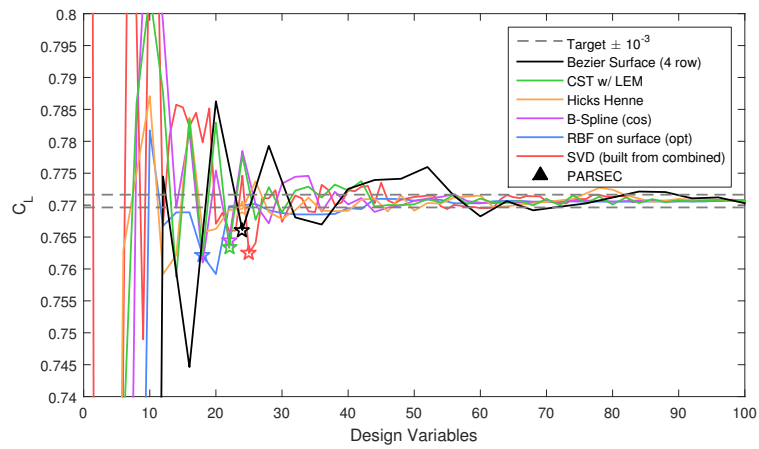


b) Drag Coefficient

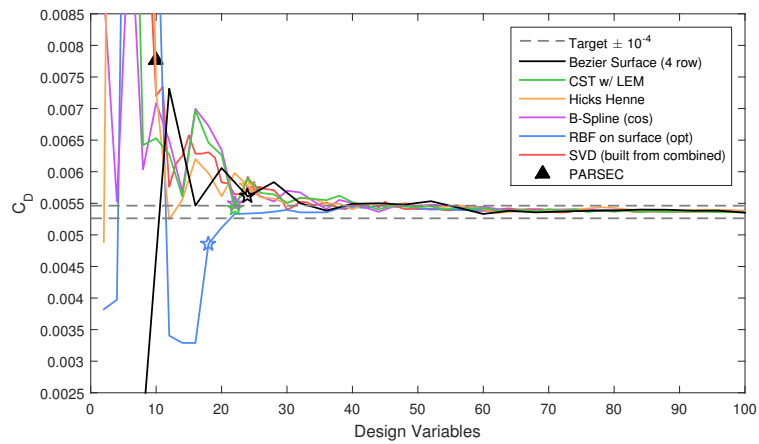


c) Max Weighted  $z$  Error

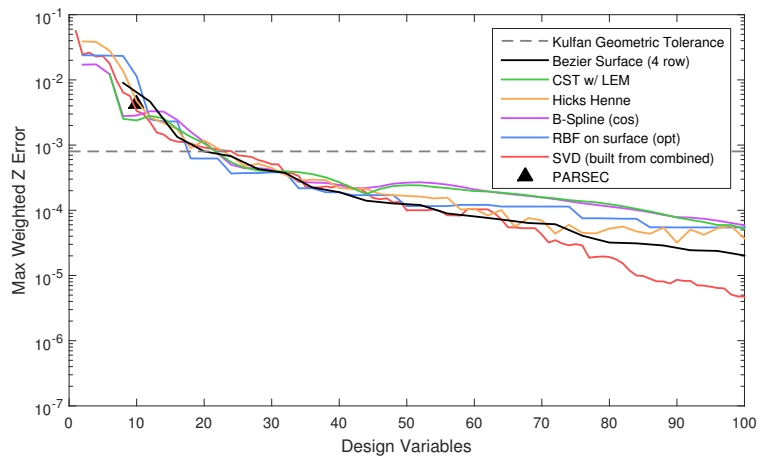
Figure 2. Convergence of aerodynamic and geometric properties for increasing design variables for each parameterisation method for the ONERA M6 case study; ★ represents first point Kulfan's geometry tolerance is satisfied.



a) Lift Coefficient

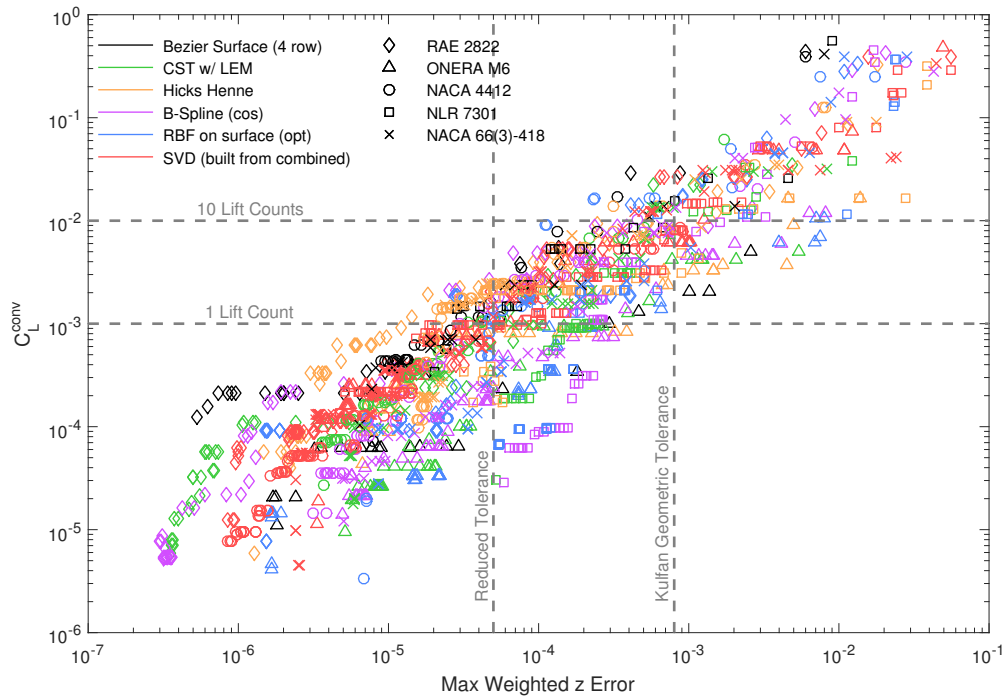


b) Drag Coefficient

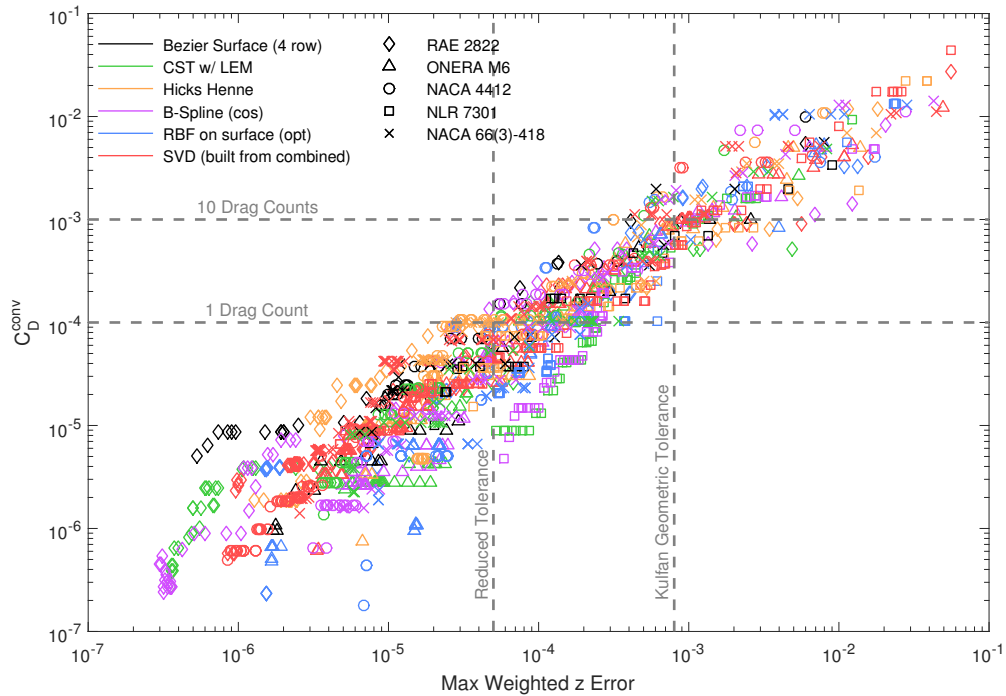


c) Max Weighted  $z$  Error

Figure 3. Convergence of aerodynamic and geometric properties for increasing design variables for each parameterisation method for the NLR 7301 case study; ★ represents first point Kulfan's geometry tolerance is satisfied.



a) Lift Coefficient



b) Drag Coefficient

Figure 4. Scatter graph of the ‘Max weighted  $z$  error’ against the convergence of the force coefficients for all case study CFD simulations.